50 – 2019
20 – 2017

Preparation

Paper Code No. D-01

Question Booklet No. 010202

ENTRANCE EXAMINATION – 2019

SET – B

ROLL NO. 

Signature of Invigilator

Time :3 HOURS

Total Marks: 170

Instructions to Candidates

1. Do not write your name or put any other mark of identification anywhere in the OMR Response Sheet. **IF ANY MARK OF IDENTIFICATIONS IS DISCOVERED ANYWHERE IN OMR RESPONSE SHEET, the OMR sheet will be cancelled, and will not be evaluated.**
2. This Question Booklet contains the cover page and a total of **170 Multiple Choice Questions of 1 mark each**
3. Space for rough work has been provided at the beginning and end. Available space on each page may also be used for rough work.
4. **There is negative marking in Multiple Choice Questions. For each wrong answer, 0.25 marks will be deducted.**
5. USE/POSSESSION OF ELECTRONIC GADGETS LIKE MOBILE PHONE, iPhone, iPad, page ETC. is strictly **PROHIBITED.**
6. Candidate should check the serial order of questions at the beginning of the test. If any question is found missing in the serial order, it should be immediately brought to the notice of the Invigilator. No pages should be torn out from this question booklet.
7. Answers must be marked in the OMR response sheet which is provided separately. OMR Response sheet must be handed over to the invigilator before you leave the seat.
8. The OMR response sheet should not be folded or wrinkled. The folded or wrinkled OMR/Response Sheet will not be evaluated.
9. Write your Roll Number in the appropriate space (above) and on the OMR Response Sheet. Any other details, if asked for, should be written only in the space provided.
10. There are four options to each question marked A, B, C and D. Select one of the most appropriate options and fill up the corresponding oval/circle in the OMR Response Sheet provided to you. The correct procedure for filling up the OMR Response Sheet is mentioned below.
11. Use Black or Blue Ball Pen only for filling the ovals/circles in OMR Response Sheet. Darken the selected oval/circle completely. If the correct answer is 'B', the corresponding oval/circle should be completely filled and darkened as shown below.

CORRECT METHOD

(A) (●) (C) (D)

WRONG METHOD

(A)(⊗)(C)(D) (A)(✓)(C)(D) (A)(●)(C)(D) (A)(●)(C)(D) (A)(B)(C)(D) (A)(●)(C)(●)

SET – B

1. A system of equations $\left.\begin{matrix} a_1x + b_1y + c_1 = 0 \\ a_2x + b_2y + c_2 = 0 \end{matrix}\right\}$ has no solution, if:

(A) $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$

(B) $\frac{a_1}{a_2} = \frac{b_1}{b_2}$

(C) $\frac{a_1}{a_2} \neq \frac{b_1}{b_2} = \frac{c_1}{c_2}$

(D) $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$

2. For what value of k equations $x + 5y - 7 = 0, 4x + 20y + k = 0$ represent the coincident lines?

(A) $k = 6$

(B) $k = 7$

(C) $k = 21$

(D) $k = -28$

3. The solution of the system of equations $\frac{x+y-8}{2} = \frac{x+2y-14}{3} = \frac{3x+y-12}{11}$ is:

(A) $x = 3, y = 4$

(B) $x = 2, y = 6$

(C) $x = 1, y = -1$

(D) $x = 6, y = 3$

4. In a cyclic quadrilateral ABCD, $\angle A = (2x + 4)^\circ$, $\angle B = (y + 3)^\circ$, $\angle C = (2y + 10)^\circ$ & $\angle D = (4x - 5)^\circ$, then the greatest angle is equal to:

(A) 130°

(B) 110°

(C) 150°

(D) 127°

5. If $\sqrt{\frac{x}{y}} + \sqrt{\frac{y}{x}} = \frac{10}{3}$ and $x + y = 10$, then xy equals:

(A) 24

(B) 9

(C) 16

(D) 36

6. The 11th term of the A.P. $-3, -\frac{1}{2}, 2, \ldots\ldots$ is equal to:

(A) 28

(B) -32

(C) 42

(D) 22

7. The 5th term of an A.P. is 11 and 9th term is 7, then 16th term is equal to:

(A) 0
(B) 16
(C) 24
(D) 14

8. The value of k so that $k+2, 4k-6$ and $3k-2$ are three consecutive terms of an A.P., is equal to:

(A) 0
(B) 3
(C) 5
(D) 1

9. In an A.P. the first term is 2, the last term is 29 and the sum is 155, then the common difference is

(A) 5
(B) 3
(C) 4
(D) 6

10. How many multiples of 4 lie between 10 and 250?

(A) 40
(B) 50
(C) 60
(D) 30

11. The condition that the roots of the equation $lx^2 + mx + n = 0$ be in the ratio 3 : 4 is

(A) $12n^2 = 49ml$
(B) $12l^2 = 49mn$
(C) $12m^2 = 49nl$
(D) None of the above

12. The solution of equation $(a-b)x^2 - (a+b)x + 2b = 0$ is

(A) $1, \frac{a}{a-b}$
(B) $1, \frac{b}{a-b}$
(C) $1, \frac{-a}{a-b}$
(D) $1, \frac{2b}{a-b}$

13. The equation $x^2 - 4x + k = 0$ has no real root if:

(A) $k > 4$
(B) $k < 4$
(C) $k = 4$
(D) None

14. The value of k so that the sum of the roots of equation $3x^2 + (2k+1)x - k - 5 = 0$ is equal to the product of roots, is:

(A) 4
(B) -4
(C) 0
(D) ± 4

15. If $x = \sqrt{12 + \sqrt{12 + \sqrt{12 + \cdots}}}$ then the value of x, is equal to:

(A) 12
(B) 3
(C) -3
(D) -4

16. The speed of a boat in still water is 8 km/hr. It can go 30 km upstream and 44 km downstream in 10 hours, the speed of the stream is equal to:

(A) 3 km/hr
(B) 4 km/hr
(C) 5 km/hr
(D) 2 km/hr

17. The hypotenuse of a right triangle is $3\sqrt{10}$ cm. if the smaller leg is tripled and the longer leg is doubled, the new hypotenuse will be $9\sqrt{5}$ cm. then the other legs of the triangle are (in cm):

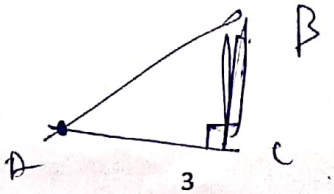
(A) 3, 6
(B) 5, 7
(C) 3, 7
(D) 3, 9

18. If PQ is a tangent to a circle with center O at the point P and ΔOPQ is an isosceles triangle, then $\angle OQP$ is equal to:

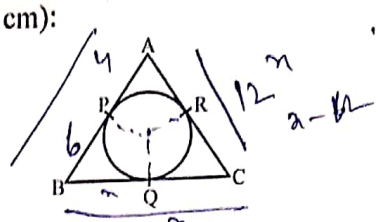
(A) 90°
(B) 60°
(C) 30°
(D) 45°

19. If C is middle point of an arc ACB of a circle, then the tangent at C is equal to:

(A) Parallel to chord AB
(B) Perpendicular to chord AB
(C) Equal to chord AB
(D) None of these

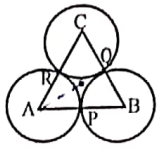


20. In the given figure, ΔABC is at P, Q, R. if $AP = 4\ cm$, $BP = 6\ cm$, $AC = 12\ cm$ and $BC = x\ cm$, then x equals (in cm):



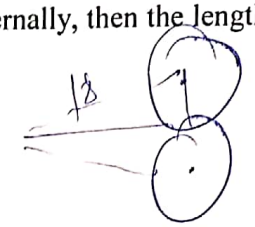
(A) 10
(B) 6
(C) 18
(D) 14

21. In the given figure, three circles with centers A, B, C, respectively touch each other externally. If AB = 5 cm, BC = 7 cm and CA = 6 cm, then the radius of the circle with center A is (in cm):



(A) 1
(B) 3
(C) 4
(D) 2

22. Two circles of radii 18 cm and 8 cm touch externally, then the length of common tangent (in cm.) is equal to:



(A) 15
(B) 13
(C) 24
(D) 16

23. If a circles touches all four sides of a quadrilateral ABCD. If AB = 14 cm, BC = 10 cm and CD = 15 cm, then AD equals (in cm):

(A) 19
(B) 11
(C) 10
(D) 9

24. ABC is a right angled triangle with a right angle at B and AB = 6 cm and BC = 8 cm. A circle with center O is inscribed inside the triangle then the radius of the inscribed circle is (in cm) equal to:

(A) 4
(B) 3
(C) 2
(D) 1

25. Two circles with radii 'a' and 'b' touch each other externally. If 'c' be the radius of a circle which touches these two circles as well as a common tangent to the two circles then which of the following is true?

(A) $\frac{1}{\sqrt{a}} = \frac{1}{\sqrt{b}} + \frac{1}{\sqrt{c}}$

(B) $\frac{1}{\sqrt{c}} = \frac{1}{\sqrt{a}} + \frac{1}{\sqrt{b}}$

(C) $\frac{1}{\sqrt{a}} = \frac{1}{\sqrt{b}} - \frac{1}{\sqrt{c}}$

(D) $\frac{1}{\sqrt{c}} = \frac{1}{\sqrt{a}} - \frac{1}{\sqrt{b}}$

26. If the perimeter and the area of a circle are numerically equal, then the radius of the circle is equal to:

(A) π units

(B) 2 units

(C) 4 units

(D) 7 units

27. By making 1000 revolution, a wheel covers 88km, then the diameter of the wheel is (in m):

(A) 40
(B) 14
(C) 9.32
(D) 28

28. If the radius of a circle is increased by 100%, then by what percent its area is increased?

(A) 300%
(B) 150%
(C) 100%
(D) 200%

29. Area of a sector of angle p(in degrees) of circles with radius R is equal to:

(A) $\frac{p}{180} \times 2\pi R$

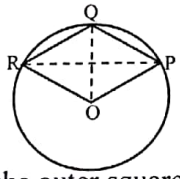
(B) $\frac{p}{180} \times \pi R^2$

(C) $\frac{p}{360} \times 2\pi R$

(D) $\frac{p}{720} \times 2\pi R^2$

30. OPQR is a rhombus, three of whose vertices lie on the circle with center O. if the area of rhombus is $32\sqrt{3}\ cm^2$, then the radius of the circle is equal to:

(A) 6 cm
(B) 4 cm
(C) 10 cm
(D) 8 cm



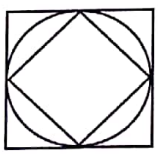
31. The ratio of the area of the outer square to the area of the inner square in the diagram is:

(A) $\sqrt{2} : 1$

(B) $2 : 1$

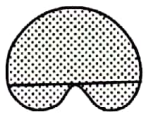
(C) $3 : 1$

(D) $4 : 1$



32. The area of shaded region in the given figure in which the radius of bigger semi circle is 14 cm and smaller semi circles radius 7 cm is (in cm^2) equal to:

(A) 308
(B) 362
(C) 154
(D) 462



33. If $\tan\theta = \frac{4}{3}$, then the value of $\frac{3\sin\theta + 2\cos\theta}{3\sin\theta - 2\cos\theta}$ is equal to:

(A) 2
(B) 3
(C) $\frac{3}{5}$
(D) 1

34. If $4\cos A = 3\sin A$, then the value of $2\sin A + 3\cos A$ is equal to:

(A) $\frac{5}{17}$
(B) $\frac{18}{5}$
(C) $\frac{17}{5}$
(D) $\frac{5}{18}$

35. The value of $(1 + \tan\theta + \sec\theta) \times (1 + \cot\theta - cosec\,\theta)$ equals:

(A) 1
(B) 2
(C) 0
(D) -1

36. If $x = r\sin\theta\cos\theta, y = r\sin\theta.\sin\theta\ z = r\cos\theta$ then $x^2 + y^2 + z^2 =$

(A) r^2
(B) $r^2\cos^2\theta$
(C) $r^2\sin^2\theta$
(D) $r^2\cos\theta.\sin\theta$

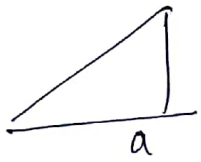
37. If $x = a\sin\theta, y = b\tan\theta$, then following is true:

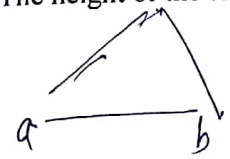
(A) $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$
(B) $\frac{a^2}{x^2} + \frac{b^2}{y^2} = 1$
(C) $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$
(D) $\frac{a^2}{x^2} - \frac{b^2}{y^2} = 1$

38. The value of $\frac{\sin 31°}{\cos 59°} + \frac{tan\ 37°}{\cot 53°}$ is equal to:

(A) 2
(B) 1
(C) 0
(D) -1

39. The angle of elevation of the top of a tower from two points at a distance of 'a' and 'b' from the base and in the same straight line with it are complementary. The height of the tower is equal to:

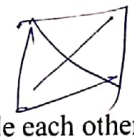




(A) ab
(B) $\sqrt{ab}$
(C) $3\sqrt{ab}$
(D) $\frac{a}{b}$

40. The angle of elevation of the top of a hill at the foot of a tower is $60°$ and the angle of elevation of top of the tower from the foot of the hill is $30°$. If the tower is $50\ m$ high, then height of the hill is (in m) equal to:

(A) 124
(B) 136
(C) 150
(D) 156



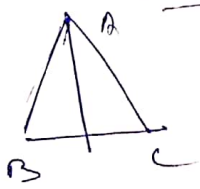
41. If the diagonals of a quadrilateral divide each other proportionally, then it is:

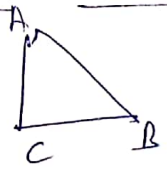
(A) A parallelogram
(B) a trapezium
(C) a rhombus
(D) a rectangle

42. Height of two similar triangles are respectively 2 cm and 3 cm , then the ratio of their areas is equal to:

(A) 2 : 3
(B) 3 : 2
(C) 4 : 9
(D) 9 : 4

43. ABC is an isosceles right triangle, right angled at C then the following relation is correct:

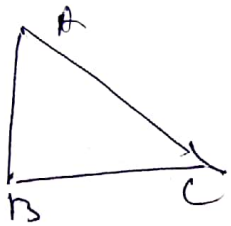




(A) $AB^2 = \frac{1}{2} AC^2$
(B) $AB^2 = 2AC^2$
(C) $AB^2 = AC^2$
(D) $AB^2 = \frac{1}{3} AC^2$

44. A toy is in the form of a cone mounted on a hemisphere of diameter 7cm. the total height of the toys is 145 cm, then the volume of toy is (in cm^3) is equal to:

(A) 234
(B) 231
(C) 245
(D) 321



45. If a cube inscribed in a sphere and another sphere is inscribed in a cube, then the ratio of their volumes is equal to:

(A) 3 : 1

(B) $3\sqrt{3} : 1$

(C) $\sqrt{3} : 1$

(D) $\sqrt{2} : 1$

46. A well of diameter 2 m is dug 14 m deep. If the earth taken out it to is spread evely all around embankment, then its height is (in m) equal to:

(A) 1.02
(B) 0.8
(C) 0.4
(D) 0.6

47. The metallic sphere of diameter 21 cm is melted and recast into small cones each of diameter 7 cm and height 3 cm. The number of cones so obtained is equal to:

(A) 127
(B) 126
(C) 125
(D) 124

48. The mean of the following distribution:

Class interval	0-20	20-40	40-60	60-80	80-100
Frequency	7	p	10	9	13

is equal to 54, then the value of p equals:

(A) 11
(B) 16
(C) 10
(D) 15

49. The mean of n observations is $\overline{X}$. if the first item is increased by 1 second by 2 and so on, then the new mean is:

(A) $\overline{X} + n$

(B) $\overline{X} + \frac{n}{2}$

(C) $\overline{X} + \frac{n+1}{2}$

(D) $\overline{X} + \frac{n-1}{2}$

50. A bag contains 3 red balls, 5 black ball and 4 white balls. A ball is drawn at random from the bag. Then the probability of drawing a black ball is equal to:

(A) $\frac{1}{4}$
(B) $\frac{1}{3}$
(C) $\frac{3}{4}$
(D) $\frac{5}{12}$

51. Euclid's algorithm is stated for:
(A) Only positive integers
(B) Only negative integers
(C) Either positive integers or negative integers
(D) Neither positive integers nor negative integers

52. The H.C.F. of two numbers is 23 and their L.C.M. is 1449. If one of the numbers is 161 then the other number is equal to:

(A) 107
(B) 207
(C) 360
(D) 340

53. The largest number which divides 615 and 963 leaving remainder 6 in each case is

(A) 87
(B) 67
(C) 79
(D) 59

54. Number 1 is

(A) A prime number only
(B) A composite number only
(C) Neither prime nor composite
(D) None of these is true

55. Which of the following rational number has non-terminating repeating decimal expansion?

(A) $\frac{6}{15}$
(B) $\frac{137}{2^2.5^7.7^5}$
(C) $\frac{23}{2^3.5^2}$
(D) $\frac{13}{3125}$

56. The zeroes of quadratic polynomial is $\sqrt{2}$ and $-\sqrt{2}$ then the quadratic polynomial is:

(A) $x^2 + 2\sqrt{2}x - 2$
(B) $x^2 - 2\sqrt{2}x - 2$
(C) $-2\sqrt{2}x + 2$
(D) $x^2 + 2\sqrt{2}x + 2$

57. If α and β are the zeros of the quadratic polynomial $2x^2 - 3x + 1$, then the quadratic polynomial whose zeroes are $\frac{\alpha}{\beta}$ and $\frac{\beta}{\alpha}$ is:

(A) $2x^2 + 5x - 2$
(B) $x^2 - 5x + 2$
(C) $2x^2 - 5x + 2$
(D) $2x^2 + 5x + 2$

58. The quadratic polynomial whose zeroes are reciprocal of the zeroes of the quadratic polynomial $4x^2 - 3x - 1$, is:

(A) $x^2 - 3x + 4$
(B) $x^2 + 4x - 3$
(C) $x^2 + 3x - 4$
(D) $x^2 + 3x + 1$

59. If the polynomial $x^3 - kx^2 + 11x - 6$ is divisible by $(x - 1)$ then the value of k is equal to:

(A) 1
(B) 2
(C) 6
(D) 4

60. The graph of the line $y = -x$ is a straight line which is:

(A) Parallel to x-axis
(B) Parallel to y-axis
(C) Perpendicular to x-axis
(D) None of these is true

61. If a person jumps 1m on the surface of moon the how he will do the same on earth?

(A) 6 m
(B) $\frac{1}{6}$ m
(C) 36 m
(D) 9.8 m

62. The maximum weight of a body is:

(A) at the center of earth
(B) inside the earth
(C) on the surface of earth
(D) above the surface of earth

63. Weightlessness in a satellite is due to:

(A) inertia
(B) zero gravity
(C) center of gravity
(D) acceleration

64. In vacuum all freely falling objects:

(A) have the same speed
(B) have the same force
(C) have the same acceleration
(D) all of the above

65. A man whose mass is 50 kg climbs up 30 steps of the stairs in 30 seconds. If each stair is 20 cm high, the power used in climbing the stairs is:

(A) 1 W
(B) 0 W
(C) 10 W
(D) 100 W

66. If the speed of a moving object is increased by 50%. The percentage increase in its kinetic energy is:

(A) 125%
(B) 100%
(C) 75%
(D) none of these

67. A body running on the roof of house has:

(A) only kinetic energy
(B) only potential energy
(C) both kinetic and potential energy
(D) none of these energies

68. When an object is heated, the molecules that makes up the object:

(A) begin to more faster
(B) lose energy
(C) become heavier
(D) become lighter

69. Two blocks of lead, one twice heavy as the other, are both at 50°C. The ratio of the heat content of heavier block to that of lighter block is equal to:

(A) 0.5
(B) 1
(C) 2
(D) 4

70. When a vapour condenses into liquid, it:
(A) absorbs heat
(B) evolves heat
(C) its temperature rises
(D) its temperature drops

71. The amount of heat required to raise the temperature of 5 g of water from 20°C to 200°C is:
(A) 3750 J
(B) 3780 J
(C) 2220 J
(D) 2460 J

72. The quantity of heat required to change the temperature of 1 kg of a substance by 1°C is called its:
(A) Specific heat
(B) Total energy
(C) Latent heat
(D) Heat of Fusion

73. Specific heat of an object depends on:
(A) its mass
(B) its volume
(C) heat given to it
(D) its material

74. When a liquid is heated from 20°C to 80°C, its density:
(A) remains the same
(B) increases
(C) decreases
(D) may increase or decrease

75. On increasing temperature of a material, the quantity which decreases is:
(A) its mass
(B) density
(C) volume
(D) length

76. The expansion of length of a upon heating does not depend on its:
(A) length
(B) increase in temperature
(C) mass
(D) nature of material

77. Evaporation is the process of changing liquid into vapour:
(A) at any temperature
(B) above its boiling point
(C) at its boiling point
(D) below its boiling point

78. The time taken by a simple pendulum for 20 complete oscillation is 25 s. The time period is:

(A) 25 s
(B) 2.5 s
(C) 1.25 s
(D) 0.8 s

79. The time period of a simple pendulum is 2 s. How many times dose it pass through the mean position in 100 s?

(A) 50 times
(B) 100 times
(C) 200 times
(D) 25 times

80. The time period of a simple pendulum depends on:

(A) mass of the bob
(B) length of pendulum
(C) amplitude of oscillation
(D) all of the above

81. Sound waves are:

(A) Longitudinal
(B) Transverse
(C) Party longitudinal & Party transverse
(D) Sometimes longitudinal

82. If the period of small ripples on water is 0.1 s and their wavelength is 5 cm, Then the speed of waves is equal to:

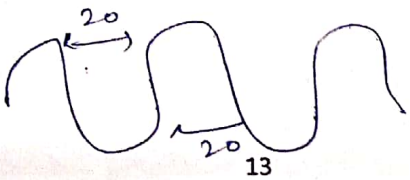
(A) 5 m/s
(B) 0.5 m/s
(C) 5 cm/s
(D) none of these

83. Sound waves travel with a speed of 330 m/s in air/vacuum. The wavelength of sound having frequency of 550 Hz in the same medium is equal to:

(A) $\frac{3}{5}$ m
(B) $\frac{5}{3}$ m
(C) 3 m
(D) none of these

84. A wave source produces 20 crests and 20 through in 0.2 second. The frequency of the wave is:

(A) 100 Hz
(B) 200 Hz
(C) 50 Hz
(D) 20 Hz



85. Magnetic field is produced by the flow of current in a straight wire. This phenomenon was discovered by:

(A) Faraday
(B) Maxwell
(C) Coulomb
(D) Oersted

86. An object moving at a speed greater than that of sound is said to be moving at:

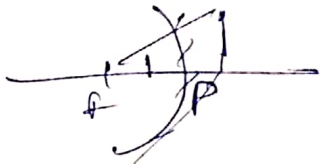
(A) ultrasonic speed
(B) infrasonic speed
(C) sonic speed
(D) supersonic speed

87. Which of the following statement is not true for a plane mirror?

(A) Image distance is equal to the object distance
(B) Image is formed on the opposite side of mirror
(C) It always forms virtual image
(D) It can form both real virtual images

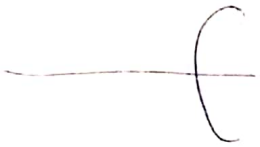
88. For a concave mirror, when the object is placed between focus and pole, the image formed is:

(A) virtual and inverted
(B) real and inverted
(C) virtual and erect
(D) real and erect



89. No matter how far you stand from a spherical mirror, your image appears erect. The mirror may be:

(A) Plane
(B) concave
(C) Convex
(D) both concave and convex

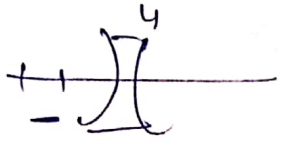


90. Take speed of light in air 3×10^8 m/s. Light enters from air to glass plate having refractive index 1.5. The speed of light in glass is equal to:

(A) 2.0×10^8 m/s
(B) 1.5×10^8 m/s
(C) 4.5×10^8 m/s
(D) 2.5×10^8 m/s

91. The power of a convex lens with focal length 10 cm is:

(A) 10 D
(B) 20 D
(C) −10 D
(D) −20 D



92. Following statements is correct for refractive index of a material:

(A) It is always greater than 1
(B) It cannot be a fraction
(C) It has its minimum value for vacuum
(D) Light travels with slower speed in a medium of higher refraction index

93. A ray of light traveling in air is incident on the plane surface of a transparent medium. The angle of incident is 45° and that of refraction is 30°. The refractive index of the medium is:

(A) 2
(B) $\frac{3}{2}$
(C) $\sqrt{2}$
(D) none of the above

94. Long sightedness can be corrected using:

(A) convex lens
(B) concave lens
(C) cylindrical lens
(D) any of these

95. Two thin lenses of power +3.5 D and −2.5 D are placed in contact. The focal length of the lens combination is:

(A) +100 cm
(B) +33.33 cm
(C) −100 cm
(D) 66.67 cm

96. A person cannot distinguish between different colours this is the problem with his:

(A) cornea
(B) ciliary muscles
(C) cones
(D) rods

97. Number of electrons passing through a conductor in 1 second to constitute 1 ampere of current is equal to:

(A) 6.25×10^{18}
(B) 6.023×10^{23}
(C) 4.25×10^{18}
(D) 6.25×10^{15}

98. 6×10^{17} electrons cross through an area per minute. The value of the electric current is equal to:

(A) 1.6 mA
(B) 1.6 μA
(C) 2 μA
(D) 2 mA

99. A 3 V battery is connected across a 5 Ω resistance. The magnitude of heat produced in 5 seconds in that resistance is equal to:

(A) 9 J
(B) 3 J
(C) 15 J
(D) 1.8 J

100. Electromagnetic induction involves conversion of:

(A) electrical energy to magnetic energy
(B) magnetic energy to electrical energy
(C) electrical energy to heat energy
(D) magnetic energy to heat energy

101. Electric motor is based on the principle of:

(A) calorimetry
(B) hydroelectricity
(C) conduction
(D) electromagnetic induction

102. A coil rotates in a magnetic field:

(A) in a motor but not in a generator
(B) in a generator but not in a motor
(C) in a motor as well as in a generator
(D) neither in a motor nor in a generator

103. Following describes the common domestic power supply in India:

(A) 220 V, 100 Hz
(B) 110 V, 100 Hz
(C) 180 V, 50 Hz
(D) 220 V, 50 Hz

104. An electric fuse is based on:

(A) the heating effect of the current
(B) the chemical effect of the current
(C) the magnetic effect of the current
(D) electromagnetic induction

105. Atom bomb is based on:

(A) chemical reaction
(B) nuclear fission
(C) nuclear fusion
(D) atomic collision

106. A bat travels a distance 8 cm from A to B and then moves a distance 6 cm at right angles to AB. The displacement is equal to:

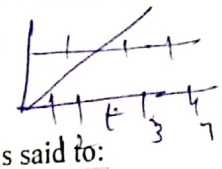
(A) 8 cm
(B) 6 cm
(C) 14 cm
(D) 10 cm

107. The amplitude of a pendulum is A. Its displacement with respect to the straight point after one complete oscillation is equal to:

(A) 0
(B) A
(C) 2A
(D) 4A

108. Following is vector quantity:
(A) electric current
(B) pressure
(C) work
(D) weight

109. A particle is traveling with constant speed and then following statement is true:
(A) its position remains constant as time passes
(B) it covers equal distance in equal intervals of time
(C) its acceleration is not equal to zero
(D) it does not change its direction of motion



110. If a particle travels equal distances in equal intervals of time, it is said to:
(A) be at rest
(B) move with constant speed
(C) move with uniform velocity
(D) move with uniform acceleration

111. When an object undergoes acceleration:
(A) Its speed always increases
(B) Its velocity always increases
(C) It always falls towards the earth
(D) A force always acts on it

112. A bullet of mass 0.01 kg fired from a weighing 5.0 kg. if the initial speed of the bullet is 250m/s, the speed with which the gun recoils is equal to:
(A) $-0.5\ m/s$
(B) $-0.25\ m/s$
(C) $0.05\ m/s$
(D) $0.25\ m/s$

113. A stationary ball weight 0.25 kg acquires a speed of 10 m/s when hit by a hockey stick. The impulse imparted to the ball is:
(A) 2.5 N s
(B) 1.5 N s
(C) 2.0 N s
(D) 0.5 N s

114. A person standing in front of a mirror finds his image larger than himself. It implies that the mirror is:
(A) plane mirror
(B) convex mirror
(C) concave mirror
(D) none of the above

115. The gravitational force between sun and planet A is F. What would be the gravitation force between sun and other planet B whose mass is four times that of planet A and is at a distance twice as that planet A?

(A) $\frac{F}{2}$
(B) $2F$
(C) F
(D) $4F$

116. Electronic configuration of Na^+ is:

(A) 2, 8, 1
(B) 2, 8
(C) 2, 8, 2
(D) 2, 8, 8, 1

117. The maximum number of electrons that can be accommodated in nth energy level is:

(A) n^2
(B) $2n^2$
(C) $2n$
(D) n

118. The electronic configuration of three elements X, Y and Z are given below

X	2
Y	2, 8, 2
Z	2, 8, 7

Which of the following statements is incorrect?

(A) valency of X is 2
(B) Y is a metal
(C) Z is a halogen
(D) none of these

119. Correct order of increasing size for the following atoms is:

$_{4}^{8}X$, $_{8}^{16}Y$, $_{12}^{24}Z$

(A) $X < Z < Y$
(B) $X < Y < Z$
(C) $Y < X < Z$
(D) $Z < Y < X$

120. Which of the following statement is not true for the periodic table?

(A) The number of periods of an element is equal to the number of element shells in its atom
(B) The group number of an element depends on the number of valance electrons in its atom
(C) If two elements have the same number of valance electrons, they belong to the same group in the periodic table
(D) If two elements belong to the same valance shell then they belong to the same group

121. Out of the following sets of elements, one element which does not belong to the set is:

(A) $^{27}_{13}A$

(B) $^{24}_{12}B$

(C) $^{23}_{11}C$

(D) $^{22}_{10}D$

122. Which of the following statements is/are true?

I. Size of an anion is greater than the atom from which it is formed

II. Atomic number of an element for its atom and ion are same

III. Electronic configurations of an atom and its ions are same

(A) I only

(B) I & II

(C) II & III

(D) I, II & III

123. The position of three elements A,B, and C in the periodic table are shown below

Group 16	Group 17
---	---
--- C	A ---
---	---
B	C

Which of the following is correct?

(A) B and C are metal

(B) C is smaller in size than B

(C) C forms cation

(D) C is more electronegative than A

124. In NaOH, the covalent bond is formed between:

(A) Na & O

(B) Na & H

(C) O & H

(D) all the bonds are ionic

125. The number of covalent bonds in Ammonia (NH_3) is/are:

(A) one

(B) two

(C) three

(D) four

126. Which of the following compounds has both ionic and covalent bonds?

(A) H_2O
(B) MgO
(C) $CaCl_2$
(D) KCN

127. Ionic is not present in:

(A) CO_2
(B) MgO
(C) NaOH
(D) $NaCl$

128. Which of the following statements for ionic compounds is/are correct?
I. They are usually crystalline solid with high melting and boiling points
II. They are soluble in organic solvents (e.g. CCl_4) but insoluble in water
III. They conduct electricity in molten state and when dissolved in water

(A) I & III
(B) I & II
(C) I only
(D) II only

129. Which of the following statements for covalent compounds is/are correct?
I. They are solids, liquids or gases
II. They have large electric conductivity
III. They are usually soluble in organic solvents and insoluble in water.

(A) I & III
(B) I & II
(C) I only
(D) III only

130. Which of the following is not true for noble gases?

(A) They are chemically non reactive
(B) They exist as mono atomic molecule
(C) They certainly have 8 electrons in their outermost shell
(D) None of the above

131. A metallic element M forms an ionic oxide M_2O. How many electrons an atom of M has in its valence shell:

(A) 1
(B) 2
(C) 3
(D) 4

132. Which of the following molecules is non-polar?
(A) HCl
(B) H_2O
(C) NH_3
(D) Cl_2

133. The chemical formula of the compound resulting from the combination of an element X of atomic number 20 with the element Y of atomic number 17 is:
(A) X_2Y
(B) XY
(C) XY_2
(D) X_2Y_3

134. The structure of diamond is:
(A) V-shaped
(B) Tetrahedral
(C) Linear
(D) Square pyramid

135. Which of the following reaction is an example of displacement reaction?
(A) $2KNO_3(s) \rightarrow 2KNO_2 + O_2$
(B) $2H_2O \rightarrow 2H_2 + O_2$
(C) $Cl_2 + 2NaBr \rightarrow Br_2 + 2NaCl$
(D) $Fe_2O_3 + 3CO \rightarrow 2Fe + 3Cl_2$

136. The reaction $H_2 + Cl_2 \rightarrow 2HCl$ is:
(A) an oxidation reaction
(B) a reduction reaction
(C) a combination reaction
(D) an isomerisation reaction

137. When a chemical substance loses one or more electrons, it is said to have been:
(A) oxidized
(B) reduced
(C) decomposed
(D) displaced

138. For what values of a, b and c respectively the following reaction is balanced?
$a\,Li + bN_2 \rightarrow c\,Li_3N$
(A) 6, 1, 2
(B) 3, 1, 2
(C) 3, 2, 1
(D) 6, 2, 1

139. Which of the following is an example of a decomposition reaction?
(A) $CaO + H_2O \rightarrow Ca(OH)_2$
(B) $2H_2O \rightarrow 2H_2 + O_2$
(C) $Fe + CuSO_4 \rightarrow FeSO_4 + Cu$
(D) $NH_4NCO \rightarrow NH_2CONH_2$

140. When a chemical substance gains one or more electrons, it is said to have been:
(A) oxidized
(B) reduced
(C) decomposed
(D) displaced

141. When sodium metal is dropped in water, it gets:
(A) oxidized
(B) reduced
(C) remains unchanged
(D) hydrolyzed

142. Which of the following statements is not correct for the rate of a reaction?
(A) it decreases with the increase in concentration
(B) it increases with the increase in temperature
(C) a catalyst always increases the rate of reaction
(D) none of the above

143. The use of a catalyst in reaction:
(A) increases the rate of forward reaction only
(B) changes the position of equilibrium
(C) decreases the rate of the reverse reaction
(D) helps to reach the equilibrium state faster by increasing the rate of both forward and backward reaction

144. The hydrogen ion concentration of a solution is 10^{-5}M. the nature of the solution is:
(A) acidic
(B) basic
(C) neutral
(D) amphoteric

145. The pH value of a solution is 3. The solution is:
(A) acidic
(B) basic
(C) neutral
(D) amphoteric

146. The pH value of a solution having 10^{-4}M concentration of H^+ ion is :
(A) 3
(B) 2
(C) 4
(D) 0.25

147. Which of the following statements is/are correct
I. The pH value of an acidic solution is less than 7
II. The pOH value of a basic solution is less than 7
III. The sum, (pH + pOH), is same for all solutions
(A) I and II
(B) I and III
(C) II and III
(D) I, II and III

148. The hydroxide ion (OH^-) concentration of a solution is 10^{-11}M. the pH value of the solution is
(A) 11
(B) 2
(C) 3
(D) 7

149. The chemical formula of Baking soda is
(A) CaO
(B) SiO_2
(C) $NaHCO_3$
(D) $Na_2CO_3.H_2O$

150. Bleaching powder is represented by the formula
(A) $CaO.CaCl_2$
(B) $Ca(OCl)Cl$
(C) $CaCl_2$
(D) $CaCO_3.CaCl_2$

151. Lime is used in metallurgical operations as a:
(A) flux
(B) matrix
(C) reducing agent
(D) oxidizing agent

152. Sulphide ores generally concentrated by:
(A) Levigation
(B) Leaching
(C) Froth Floatation
(D) Calcination

153. The ordinary sulphur exists as:
(A) S
(B) S_2
(C) S_4
(D) S_8

154. A pinch of sugar is charred when treated with conc. H_2SO_4. This shows that sulphuric acid is a:
(A) reducing agent
(B) dehydrating agent
(C) fire producer
(D) dibasic acid

155. Choose the incorrect statement:
(A) Ethanol is produced by the fermentation of sugar in presence of enzyme maltose
(B) Rectified spirit (95.6% ethanol and 4.4%water) on reflux and distillation produces 100% ethanol
(C) Both aldehydes and ketones contains C=O group
(D) Nylon is a polyamide fiber made from monobasic acids and monoamines

156. Which of the following is not the purest form of carbon?
(A) Diamond
(B) Graphite
(C) Wood charcoal
(D) Sugar charcoal

157. The phenomenon of existence of different forms of an element is known as:
(A) isomerism
(B) catenation
(C) allotropy
(D) None

158. Which of the following is a hydrocarbon?
(A) Ethane only
(B) Ethylene only
(C) Benzene only
(D) all of the above

159. The formula for benzene is:
(A) CH_4
(B) C_6H_6
(C) C_6H_{12}
(D) C_2H_6

160. Saturated hydrocarbons exhibit:
(A) Position isomerism
(B) chain isomerism
(C) ring chain isomerism
(D) all of these

161. Which of the following statements is/are correct?
I. Two atoms of hydrogen combine with one atom of oxygen to from one molecules of water
II. Two molecules of hydrogen combine with one molecule of oxygen to from one molecule water
III. Practically the whole mass of an atom is centered at its nucleus.

(A) I only
(B) III only
(C) I & III
(D) II & III

162. Which one is a chemical change?
(A) melting of ice
(B) burning a candle
(C) passing electric current through a conductor
(D) all of the above

163. In which of the following substances is an electrolyte?
(A) alcohol
(B) sodium chloride
(C) carbon dioxide
(D) sugar

164. Tyndall effect is observed due to:
(A) reflection of light
(B) refraction of light
(C) scattering of light
(D) polarization of light

165. The empirical formula of a compound containing Carbon and Hydrogen is CH_2. The molecular mass of compound is 42 amu. The molecular formula of compound is:

(A) C_2H_4
(B) C_3H_4
(C) C_3H_6
(D) C_4H_8

166. The number of molecules in 9 gm of water is about:

(A) 3×10^{23}
(B) 9×10^{23}
(C) 54×10^{23}
(D) none of the above

9 × 6.022 × 10^{23}

54

167. Which of the following is not the result of Rutherford's scattering experiment?

(A) The nucleus of an atom is positively charge
(B) Volume of the nucleus of an atom is very small as compared to the volume of extra nuclear part of atom
(C) Almost whole of the mass of the atom is concentrated at its nucleus
(D) Negatively charged particles called electrons revolve around the nucleus in circular orbits

168. Which of the following nuclei are isotopes of each other?

I. $_{231}^{90}Z$ II. $_{230}^{91}Z$ III. $_{230}^{88}Z$ IV. $_{233}^{90}Z$

(A) I and IV
(B) II and III
(C) I and II
(D) II and IV

169. Which of the following is a radioactive disintegration?

(A) α-particle
(B) β-particle
(C) γ-particle
(D) all of the above

170. According to Bohr's theory, in an atom:

(A) there are discrete energy levels
(B) the angular momentum is nh/2π
(C) in an orbit the energy of electron is fixed
(D) all of the above